Claim Rejections 35 U.S.C. § 102 (b)

The Examiner has rejected claims 54, 55, 58-60, and 63-65 under 35 U.S.C. §102 (b) as being anticipated by Burke et al. (US 5,645,469). In the Examiner's opinion, Burke et al. teaches a polishing pad (130), having a center area (fig. 8), and an edge area, with a first set of grooves located in the center area with a first depth, first width, and first density, a second set of grooves located in the edge area with a second set of grooves having a second depth, second width, and a second density. In the Examiner's opinion, Burke et al. also teaches that the first depth, width, and density is smaller than the second depth, width, and density, and that the first set of grooves and the second set of grooves differ in shape.

Applicant respectfully disagrees with the Examiner. The cited reference of Burke et al. describes a polish pad and a wafer that are rotated such that the wafer provides a planetary motion with respect to the polish pad. See lines 28-29 in Col. 1. Planetary motion necessarily means that the wafer and the polish pad rotate around two different axes. In other words, the distance (displacement) and orientation between the two axes change constantly during a polish cycle.

In contrast, Applicant's claimed invention does not involve planetary motion of a wafer with respect to a polish pad. Thus, the wafer and the polish pad rotate around the same axis. In other words, the center of the wafer and the center of the polish pad remain coincident during a polish cycle.

Applicant's claimed invention claims modification of, one or more of, depth, width, shape, and density of grooves, as a function of radius of a polish pad in order to compensate for variation in polishing rate as a function of radius of a wafer in a situation where the center of the wafer and the center of the polish pad remain coincident during a polish cycle. Consequently, rotating the wafer and the polish pad around the same axis will achieve an ideal wafer profile after polish.

Applicant wishes to point out to the Examiner that Burke et al. fails to teach any radial correspondence between the wafer and the polish pad. Figure 5, figure 6,

and figure 9 of Burke et al. all show that a center of a wafer and a center of a polish pad are not coincident during a polish cycle. On the contrary, Burke et al. teaches changes in the placement and dimensions of grooves as a function of radius of polish pad only to accommodate variation in polish of the pad due to uneven distribution of slurry. See lines 33-41 in Col. 3.

In fact, Burke et al. expressly teaches against such a radial correspondence between a wafer and a polish pad, as claimed in Applicant's claimed invention, by describing radially oscillating a wafer across polishing surface (32), so that the wafer partially extends over outer circumferential edge (34) at a first position and partially extends over the outer edge of trench (45) at a second position. See lines 6-7 in Col. 6 and see Figures 3-4. Also, see lines 12-13 in Col. 6 and see Figures 3-4.

Applicant had previously amended claims 54, 59, and 64 to indicate the criticality of such a radial correspondence between the wafer areas and the polish pad areas. Since the Burke et al. reference cited by the Examiner does not teach each and every element of Applicant's claimed invention as claimed in claims 54, 59, and 64, the cited reference of Burke et al. does not anticipate claims 54, 59, and 64 of Applicant's claimed invention.

Claims 55, 58 depend on claim 54. Claims 60, 63 depend on claim 59. Claim 65 depends on claim 64. Since the Burke et al. reference cited by the Examiner does not teach each and every element of Applicant's claimed invention as claimed in claims 55, 58, 60, 63, 65, the cited reference of Burke et al. also does not anticipate claims 55, 58, 60, 63, 65 of Applicant's claimed invention.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 54, 55, 58-60, and 63-65 under 35 U.S.C. §102 (b).

Claim Rejections 35 U.S.C. § 103 (a)

The Examiner has rejected claims 56, 57, 61, 62, 66, and 67 under 35 U.S.C. §103 (a) as being unpatentable over Burke et al. (US 5,645,469).

The Examiner has conceded that Burke et al. fails to teach the first and second depths being within a range of 1-90 % pad thickness, the first and second widths being within the range of 1-100 mils, and the first and second densities being within a range of 2-50 grooves/inch. See section 4 on page 3 of the Office Action dated November 7, 2002.

However, the Examiner then proceeded to state, without any support whatsoever in the prior art, that the above claim limitations would have been obvious to one having ordinary skill in the art at the time the invention was made.

Applicant respectfully disagrees with the Examiner. As discussed in the previous section, Burke et al. expressly teaches against the radial correspondence between a wafer and a polish pad, as claimed in the independent claims 54, 59, and 64 of Applicant's claimed invention. Since claims 56-57 depend on claim 54, claims 61-62 depend on claim 59, and claims 66-67 depend on claim 64, the cited reference of Burke et al. cannot be relied upon to state that the dependent claims are obvious to one of ordinary skill in the art at the time the invention was made.

Furthermore, the Examiner failed to mention that Burke et al. does provide exemplary dimensions of the grooves in the polish pad. See lines 36-53 in Col. 7. However, Burke et al. again teaches away from the dimensions claimed by Applicant so this rebuts a prima facie case of obviousness. See Section III of MPEP § 2144.05.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw the rejections to claims 56, 57, 61, 62, 66, and 67 under 35 U.S.C. §103 (a).

Applicant believes that all pending claims are now in condition for allowance so such action is earnestly solicited at the earliest possible date.

If there are any additional charges, please charge Deposit Account No. 02-2666. If a telephone interview would in any way expedite the prosecution of this application, the Examiner is invited to contact the undersigned at (408) 720-8300.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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